CLAIMS

1. Method of self-supported transfer of a thin film according to which :

- a source substrate is prepared,
- at least a first species of ions or gas in a first dose is implanted in that source substrate at a given depth with respect to a face of that source substrate, that first species being adapted to generate defects,
- a stiffener is applied in intimate contact with the source substrate,
- a heat treatment is applied to that source substrate, at a given temperature for a given time, so as to create, substantially at the given depth, a buried weakened zone, without initiating the thermal splitting of the thin film,
- a pulse of energy is applied to that source substrate so as to provoke the self-supported splitting of a thin film delimited between the face and the buried weakened layer, with respect to the remainder of the source substrate.

2. Method according to claim 1, characterized in that the pulse of energy is applied to a small part only of the buried weakened layer

3. Method according to claim 2, characterized in that the pulse of energy is applied in the form of a localized thermal provision.

4. Method according to claim 2, characterized in that the pulse of energy is applied in the form of a single movement that is brief and of small amplitude applied by means of a tool.

5. Method according to claim 2, characterized in that the localized provision of energy is applied in the form of a shock in a peripheral zone of the buried weakened layer.

6. Method according to claim 1, characterized in that the controlled energy pulse is applied globally to the substrate.

7. Method according to any one of claims 1 to 6, characterized in that the pulse is applied at a temperature at most equal to about 300°C.

8. Method according to claim 7, characterized in that the pulse is applied at room temperature.

9. Method according to any one of claims 1 to 8, characterized in that the heat treatment is conducted so that the area opened up by the defects is from 25% to 32% of the total area of the weakened area in the substrate.

10. Method according to claim 9, characterized in that the heat treatment is conducted so that the density of the defects is furthermore from 0.03 to 0.035 per square micron.

11. Method according to claim 9 or claim 10, characterized in that the heat treatment is conducted so that the size of the defects is furthermore of the order of 7 to 8 square microns.

12. Method according to any one of claim 1 to 11, characterized in that the stiffener with which the source substrate is placed in intimate contact, at latest at the moment of the heat treatment, is a target substrate, the heat treatment contributing to improving the bonding energy between those substrates.

13. Method according to claim 12, characterized in that the target substrate is of an amorphous material.

14. Method according to claim 12, characterized in that the source substrate is of silicon and the target substrate is of fused silica.

15. Method according to claim 12, characterized in that the target substrate is of a monocrystalline or polycrystalline material.

16. Method according to claim 15, characterized

in that the target substrate is of silicon.

17. Method according to any one of claims 1 to 16, characterized in that the first species is hydrogen.

18. Method according to claim 17, characterized in that the first species is hydrogen of H^+ type.

19. Method according to claim 18, characterized in that the first species is implanted at a dose of the order of a few 10^{16} H/cm^2.

20. Method according to any one of claims 1 to 19, characterized in that there is further implanted a second species, in a second dose, this second species being adapted to occupy the defects generated by the first species.

21. Method according to claim 20, characterized in that, in the case of implanting two species, the deeper profile is implanted first.

22. Method according to claim 20 or claim 21, characterized in that the second species is helium.

23. Method according to claim 22, characterized in that the second species is implanted at a dose of the order of few 10^{16} He/cm^2, less than the dose of the first species.

24. Method according to any one of claims 1 to 23, characterized in that the source substrate is prepared from a material chosen from semiconductors and insulators, monocrystalline, polycrystalline or amorphous materials.

25. Method according to claim 24, characterized in that the source substrate is prepared from a material chosen from the IV semiconductors.

26. Method according to claim 25, characterized in that the source substrate is made from silicon.

27. Method according to claim 24, characterized in that the substrate is made of germanium.

28. Method according to claim 24, characterized

in that the substrate is made of AsGa.

29. Method according to any one of claims 1 to 28, characterized in that the heat treatment is performed at a temperature chosen in the range 200°C-400°C.

30. Method according to claim 29, characterized in that the heat treatment is performed at a temperature chosen in the range 300°C-350°C.

31. Method according to claim 29 or claim 30, characterized in that the heat treatment is conducted for approximately 2 hours to 5 hours.

32. Method according to claim , characterized in that the source substrate is prepared from a semiconductor material of type III-V.

33. Method according to claim 32, characterized in that the source substrate is prepared from an insulator chosen from the group consisting of $LiNbO_3$ and $LiTaO_3$.